

## A New Genus and Two New Species of Neotropical Flies (Diptera; Drosophilidae)

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While visiting a cave on Mona Island, west of Puerto Rico, in October 1955, William Cross and Merle Kuns noticed some small flies riding about on the backs of land crabs. The discovery was described as follows by Dr. Cross (presently the Head of the Methods Development Unit, Screwworm Eradication Program, U. S. Department of Agriculture, Sebring, Florida) :

"On October 18, 1955, at about 6:00 P.M., a cave, Cueva los Lirios, was entered by Captain Kuns and myself and a count was made of the bats leaving this cave during the next hour. At a few minutes after 7:00 P.M., we were back near the cave entrance where there were several holes in the roof and a large bromeliad on the floor. A number of land crabs (possibly *Coenobita*) were moving about among the bromeliad and rocks on the cave floor. On approaching one of these crabs and shining a bright light on it, we noticed a number of flies, apparently *Drosophila*, moving about over its carapace. In collecting a few it was observed that they could be frightened off the crab but would quickly return."

Several visits were made to the cave and eleven adult specimens of the fly were collected. The land crab involved was never identified with certainty, but it may have been *Cardisoma guanhumii* which is widely distributed in this region.

In February 1956, Dr. William B. Heed was making collections of Drosophilidae in Puerto Rico for the Genetics Foundation of the University of Texas, and had an opportunity to study the specimens from Mona Island. He determined that they were *Drosophila*, and that the species was probably undescribed, whereupon Dr. Cross very kindly donated the specimens to the *Drosophila* collection at the University of Texas. The species is described below as *Drosophila carcinophila* n. sp.

What appears to have been the same species of fly was collected earlier by Mr. H. G. Hubbard in 1894 on Montserrat, a

small island of the British West Indies, a member of the Leeward Group located approximately 250 miles southeast of Puerto Rico. His collections are now represented by three items in the Diptera collection of the U. S. National Museum: (1) a single puparium, labelled "Drosophila from mouth of land crab; Mntserrat, April 15, W. I.; H. G. Hubbard, collector;" (2) an empty pin to which we presume an adult fly had once been attached but which has since been lost, the pin bearing the same labels as the preceding; and (3) a portion of the mouthparts of a crab to which about 20 puparia are attached, bearing labels as follows: "Maxilla of land crab; April 14th, 94; Montserrat B. W. I.; Dipt. messmates; Drosophila from land crab; H. G. Hubbard, collector; Mntserrat, Apr. 14, W. I."

These puparia are of the size one would expect for the *Drosophila* from Mona Island. Each puparial segment bears a prominent transverse row of small reddish knobs, and there are two such rows, with fewer knobs, on the operculum. The posterior spiracles are pale and divergent; the anterior spiracles are sessile and are situated before the apex, somewhat as in certain species of *Megaselia* (Phoridae).

### ***Drosophila carcinophila* new species**

♂♀. A small, dull brownish fly with three strong pairs of dorsocentral bristles; mesonotal hairs and bristles standing rather upright, giving a distinctly bristly appearance.

Front dull, light tannish brown; face paler. Carina high and thin, not sulcate. Arista with 4 dorsal and 2 ventral branches in addition to the terminal fork. Vibrissa single, strong, followed only by short hairs. Cheeks rather broad, a little less than width of 3rd antennal segment, yellowish but more brownish tinged just below lowest point of eye, the latter with thick pile. Palpi tan. Proclinate orbital about  $\frac{3}{4}$  length posterior reclinate; anterior reclinate thinner, about  $\frac{1}{2}$  length proclinate and situated just behind it at about  $\frac{1}{3}$  the distance between the proclinate and the posterior reclinate. Inner verticals in front of outers, the latter only slightly more laterad in position.

Mesonotum light brown with rusty tinge. Three pairs of dorsocentral bristles, the anterior one presutural, situated just before the inner edge of the transverse suture; some acrostichal hairs enlarged in dorsocentral rows. Acrostichals irregular, in 2 rows posteriorly, roughly 4-rowed along middle of mesonotum, becoming 6-rowed more anteriorly; prescutellars slightly enlarged. Basal scutellars convergent. Pleura colored as mesonotum, paler below. Anterior sternopleural  $\frac{2}{3}$  length posterior. Halteres pale. Legs pale, slender, the tarsal claws reduced. Sutural and anterior notopleural bristles strong, posterior notopleural shorter.

Abdominal tergites with rather pale brownish bands, weakly interrupted medianly, at least on basal segments. First and second tibiae with apical bristles, preapicals on all three. Wings hyaline; costa reaching to apex of 4th vein; third costal section with the small black bristles on the basal half or a trifle more. Costal index about 2.0-2.2; 4th vein index 2.2-2.4; 5x index about 2.0.

Female body length about 2.5 mm., wing, 2.0 mm. Male body length about 2.0 mm., wing, 2.0 mm.

*Holotype* male and 2 *paratypes*, labelled "Cueva los Lirios, Mona Is. PR; M. L. Kuns; 1 Nov. 1955." Eight paratypes labelled "Cueva los Lirios, Mona Is. PR; WHC; 20 Nov. 55." Two paratypes are being placed in the U. S. National Museum collection; the remaining types are in the *Drosophila* Type and Reference Collection of the University of Texas.

#### DISCUSSION

Although the evidence is rather meager, it seems most likely that the adult flies from Mona Island and the puparia from Montserrat represent the same species. The adults are closely associated with the land crabs, running about over the carapace, while the larvae apparently feed on the debris (or on the microorganisms in the debris) on the mouthparts of the crabs. It would be interesting to know if the adults also feed on this debris.

Other Diptera have been found associated with crabs, but apparently never in such an intimate fashion. *Asyndetus carcino-philus* (Dolichopodidae) has been observed at the entrances of crab holes on the dry beach above tide level in Hawaii (Dr. W. W. Wirth, personal communication), and species of *Rhinoessa* (Tethinidae), *Hecamede* (Ephydriidae), and *Lasiopleura* (Chloropidae), as well as several species of mosquitoes have been found in and around crab holes. As far as we know, however, none of these is truly commensal on the crabs.

Van Beneden (1885, *Animal Parasites and Messmates*, Appleton, New York) pointed out the desirability, and difficulty, of distinguishing between parasites, messmates (*commensaux* or commensals), and mutualists. Writing with an interesting humanistic approach, he stated: "The messmate is he who is received at the table of his neighbour to partake with him of the produce of his day's fishing. . . . The messmate does not live at the expense of his host; all that he desires is a home or his friend's superfluities. . . . The greater part of those animals which have established themselves on each other, and live together on a good understanding and without injury, are wrongly classed as parasites by the generality of naturalists. Now that the mutual relations of many of these are better understood, we know many animals which unite together to render each other mutual assistance; while there are others which live like paupers on the crumbs which fall from the rich man's table." One suspects that Van Beneden would have considered *Drosophila carcinophila* an excellent example of a commensal of the pauper class.

#### MAYAGUEZA, new genus

This new genus from Puerto Rico is based upon thirteen specimens from the collection of the U. S. National Museum, Washington, D. C. I wish to thank Dr. Willis Wirth who arranged for the loan of the material, Mrs. Linda Kuich who prepared the figures of the head, and Dr. Frances Clayton who made the wing photograph.

The genus belongs with that group of genera of the Drosophilidae, subfamily Steganinae, which possess a bare to pubescent arista, strong prescutellars, divergent basal scutellars, and three nearly equal orbital bristles. It appears to be most similar to *Pseudiasata*, *Cacoxenus* and *Acletoxenus*. Some of the more useful recognition features of these genera, as compared with *Mayagueza*, are as follows:

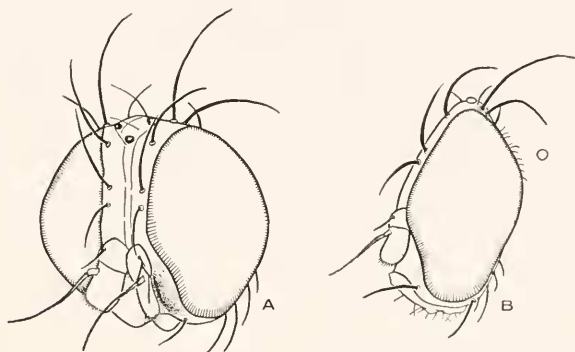


FIG. 1. Head of *Mayagueza argentifera*. A—semi-dorsal view; B—profile.

*Mayagueza*: Ocellars very small, directed upright, cruciate, not at all proclinate; postvertical bristles moderately small; front narrow; no sutural bristle; no propleural bristle; anterior dorso-central quite small, situated very close to, and in line with, the posterior one; wing with distinctive clouds.

*Pseudiasata*: Ocellars small, proclinate; postverticals of normal size; front narrow or of moderate width; sutural bristle of normal size; propleurals absent; dorsocentrals not aligned, the long posterior ones moved more laterad; wings pictured or hyaline.

*Cacoxenus*: Ocellars of normal size, proclinate; postverticals rather small; front of moderate width; suturals moderately small; propleurals present; dorsocentrals aligned; wings hyaline.

*Acletoxenus*: Ocellars absent; postverticals small; front narrow; suturals small; presence of propleurals and alignment of dorsocentrals not reported; wings hyaline.

The argenteous mesonotum and pattern of wing maculation suggest certain species of *Leucophenga*, but there are no other important similarities.

The type species of *Mayagueza* is *M. argentifera*, the following new species.

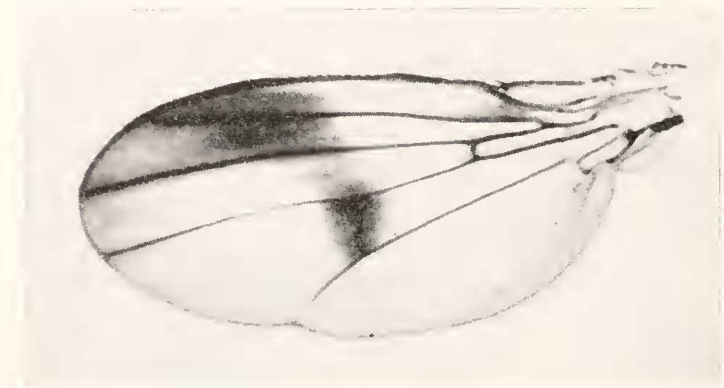


FIG. 2. *Mayagueza argentifera*, wing.

### ***Mayagueza argentifera*, new species**

♂♀. A yellowish species with striking silvery to whitish bloom over the mesonotum. Front pale whitish yellow, very narrow in both sexes (Fig. 1); ocellar area contrastingly bluish gray. Face, antennae, cheeks, palpi and proboscis all yellow. Ocellar bristles small and thin, cruciate, directed upward rather than forward. Three stout orbital bristles, arranged as shown in the figure. Arista with short thick pubescence. Face not truly flat but rather evenly rounded over the central area. Cheeks very narrow. Clypeus narrow, pale; palpi small; vibrissa single and strong.

Disc of mesonotum light tan with prominent silvery to whitish bloom when viewed from certain angles. Pleura and legs wholly pale yellow. Basal scutellars divergent; apical scutellars about  $\frac{2}{3}$  length basals. Posterior dorsocentral long and strong, anterior one quite small, barely distinguishable from the adjacent

hairs. Acrostichal hairs in numerous irregular rows. One strong humeral; no sutural bristle; two strong sternopleurals, the anterior one only slightly shorter than the posterior. No propleurals.

Legs wholly pale; front femora without outstanding bristles. Strong apicals and preapicals present only on second tibia. Wings as in Fig. 2. Abdominal pattern not well preserved on any specimen, but the abdomen is apparently pale tannish yellow with some black median marks or splotches on the tergites. Genital arch of the male large, tapering below, the extreme lower apex bearing a single stout black tooth.

Body length, about 3.0 mm.; wing, 2.3 mm.

*Holotype* male and 12 *paratypes*, USNM collection, all bearing identical labels: Mayaguez, P. R., 15 June 1953; J. A. Ramos, collector.

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## New State Records of Zoraptera

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Collections near the periphery of the known range of *Zorotypus hubbardi* Caudell have yielded the first records for the states of Iowa and Kansas. Also, three colonies were located in northeastern Oklahoma where previously this insect has been reported from only the very southeast corner of the state, apparently on the basis of one specimen (U. S. D. A. Econ. Insect Report 9(3): 22, 1959).

The presence of *Zorotypus* in Iowa was first detected by the junior author in northern Wapello Co. (approximately 41°8'N). This is the most northerly record yet published, surpassing his DeWitt Co., Ill., record (below) and the Pennsylvania locality given by Gurney (Proc. Ent. Soc. Wash. 61(4): 183-184, 1959). The Kirkville, Iowa, location is less than one degree